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TITLE: DISK LOADING/UNLOADING MECHANISM FOR FLOPPY DISK DEVICE

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ABSTRACT:

PURPOSE: To prevent the occurrence of fault of a magnetic head due to dust by providing a front panel and a dust proof mechanism, arranging a front panel to the side face of a floppy disk device main body and providing the 1st and 2nd dust-proof mechanisms in the device main body to the dust proof mechanism thereby decreasing the invasion of dust.

CONSTITUTION: The front panel 20 is provided to the side face of the floppy disk device main body and a loading/unloading slit 14 used to load/unload a disk 13 is provided. The dust proof mechanism consists of the 1st and 2nd dust proof mechanism 21, 22 opposed to each other, dust proof members 21b, 22b are made of a material such as felt made pad and placed to shut the loading/unloading slit 14 externally in unloading the disk 13. Thus, the invasion of external dust while no disk 13 is loaded into the device main body is reduced remarkably. Moreover, the dust adhered to the disk at the loading of the disk is removed to prevent entirely the event causing hindrance to the read/write of the magnetic head due to dust.

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⑭ 発明の名称 フロッピーディスク装置のディスク出入れ機構

⑯ 特 願 昭62-18605

⑰ 出 願 昭62(1987)1月30日

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明 細 書

1. 発明の名称

フロッピーディスク装置の
ディスク出入れ機構

2. 特許請求の範囲

(1) フロッピーディスク装置本体の側面にディスクの出入れ用スリットが形成されたフロントパネルと、前記出入れ用スリットから前記フロッピーディスク装置本体内部に挿入される前記ディスクの一方面に接触する防塵用部材を有し前記ディスクの出入れに応じて一方端を支点として回転駆動するように前記フロッピーディスク装置本体内部に設けられた第1の防塵機構と、前記出入れ用スリットから前記フロッピーディスク装置本体内部に挿入される前記ディスクの他方面に接触する防塵用部材を有し前記ディスクの出入れに応じて一方端を支点として回転駆動するように前記フロッピーディスク装置本体内部に設けられた第2の防塵機構とを具備したことを特徴とするフロッピーディスク装置のディスク出入れ機構。

(2) 前記第1の防塵機構は、前記ディスクが前記フロッピーディスク装置本体内部のスピンドル機構にロードされた際に前記防塵用部材が前記フロントパネル側へ移動する範囲を制限するための制限部材を備えていることを特徴とする特許請求の範囲第1項記載のフロッピーディスク装置のディスク出入れ機構。

3. 発明の詳細な説明

[発明の目的]

(産業上の利用分野)

本発明は、ディスクをフロッピーディスク装置本体内部に挿入する際に防塵を行なうための機能を備えたフロッピーディスク装置のディスク出入れ機構に関する。

(従来の技術)

従来、フロッピーディスク装置では、磁気記録媒体であるディスクが頻りに出入れされている。このため、特にディスクの挿入時に、フロッピーディスク装置本体内部に外部から塵が混入するような事態が起きる。記録密度が比較的低い場合には

それほど問題はないが、高記録密度のディスクを使用する際にはハードディスク装置と同様の防塵機能が必要となる。

このような防塵機能を実現する手段として、例えば第4図に示すように、フロッピーディスク装置のフロントパネル10にドア11が設けられている。ドア11は、一方端がフロントパネル10に取付けられており、スプリング12により常時フロントパネル10側へ付勢されている。ディスク13が外部からフロントパネル10に形成された出入れ用スリット14を通じて挿入されると、第5図に示すように、ドア11はディスク13の押圧力でフロントパネル10から離れるように回転する。ディスク13は、フロッピーディスク装置本体内に挿入されると、第6図に示すような状態で、図示しないスピンドル機構にロードされることになる。ディスク13が内部からイジェクトされると、ドア11は、第4図に示す状態に復帰する。

このようなドア11を使用した機構により、外部からの塵の進入を防止することが可能となるが、

入れ機構である。フロントパネルは、フロッピーディスク装置本体の側面に設けられており、ディスクの出入れ用スリットが形成されている。防塵機構は、フロッピーディスク装置本体内に設けられた第1及び第2の防塵機構からなる。第1の防塵機構は、出入れ用スリットからフロッピーディスク装置本体内に挿入されるディスクの一方面に接触する防塵用部材を有し、ディスクの出入れに応じて一方端を支点として回転駆動するように構成されている。また、第2の防塵機構は、出入れ用スリットからフロッピーディスク装置本体内に挿入されるディスクの他方面に接触する防塵用部材を有し、ディスクの出入れに応じて一方端を支点として回転駆動するように構成されている。

このような機構であれば、ディスクの挿入時にディスクに付着した塵を除去し、ディスクに付着した塵による磁気ヘッドに対する悪影響を防止することが可能となる。

(実施例)

以下図面を参照して本発明の実施例を説明す

ディスク13に付着した塵はディスク13と共に内部に進入することになる。このため、ディスク13に付着した塵により、磁気ヘッドのリード/ライト動作に支障を来すような事態が発生することがある。

(発明が解決しようとする問題点)

前記のように従来の防塵機構では、ディスク13に付着した塵がディスク13の挿入と共にフロッピーディスク装置本体内に進入し、磁気ヘッドに対して悪影響を与える問題がある。

本発明の目的は、ディスクが挿入されていない状態での外部からの塵の進入を低減し、さらにディスクに付着した塵により磁気ヘッドに支障が発生することを大幅に防止することができるフロッピーディスク装置のディスク出入れ機構を提供することにある。

[発明の構成]

(問題点を解決するための手段と作用)

本発明は、フロッピーディスク装置において、フロントパネル及び防塵機構を備えたディスク出

る。第1図は同実施例のディスク出入れ機構の構成を示す側面断面図である。第1図において、フロントパネル20は、フロッピーディスク装置本体(以下単に装置本体と称す)の側面に設けられており、ディスク13の出入れに使用される出入れ用スリット14が形成されている。フロントパネル20の装置本体内部には、防塵機構が取付けられている。

防塵機構は、対向して設けられる第1の防塵機構21及び第2の防塵機構22からなる。第1の防塵機構21は、フロントパネル20の所定の位置に一方端が取付けられた機構本体21a、この機構本体21aに取付けられた防塵部材21b、機構本体21aを常時フロントパネル20側へ付勢するためのスプリング21c及び機構本体21aに一体化された制限部材21dからなる。同様に、第2の防塵機構22は、フロントパネル20の所定の位置に一方端が取付けられた機構本体22a、この機構本体22aに取付けられた防塵部材22b及び機構本体22aを常時フロントパネル20側へ付勢するためのスプリング22c

からなる。

各防塵部材21b, 22bは、それぞれ例えばフェルト製のパッドであり、ディスク13の非挿入時には出入れ用スリット14を外部から遮断するように位置決めされる。制限部材21dは、機構本体21aに対して所定の角度を以て形成されており、ディスク13のロード時に機構本体21aのフロントパネル20側への移動を制限するための部材である。

次に、同実施例の動作を説明する。まず、ディスク13の非挿入時では、第1図に示すように、第1の防塵機構21及び第2の防塵機構22の各機構本体21a, 22aは、それぞれのスプリング21c, 22cの作用によりフロントパネル20側へ付勢されている。これにより、各機構本体21a, 22aに取付けられた防塵部材21b, 22bがドアの動きを行なうことになり、外部からの塵の進入を遮断することになる。

次に、ディスク13が出入れ用スリット14から挿入されると、ディスク13が各防塵部材21b, 22bに接触して、各機構本体21a, 22aを押圧するよ

うに作用する。即ち、第2図に示すように、第1の防塵機構21の機構本体21aは、装置本体内部の上側へフロントパネル20の取付け部を支点として回転する。同様に、第2の防塵機構22の機構本体22aは、装置本体内部の上側へフロントパネル20の取付け部を支点として回転する。このとき、ディスク13はその表面が防塵部材21bに接触した状態で挿入されるため、防塵部材21bにより表面に付着した塵が除去されることになる。同様に、ディスク13の裏面が防塵部材22bに接触されるため、防塵部材22bにより裏面に付着した塵が除去されることになる。

ディスク13は装置本体内に完全に挿入されると、装置本体内のスピンドル機構にロードされることになる。このスピンドル機構により、ディスク13は回転駆動されることになる。このロード状態で、第3図に示すように、第2の防塵機構22の機構本体22aは防塵部材22bがディスク13の裏面に接触して、装置本体内の所定の位置で保持されている。また、第1の防塵機構21の機構本体21aは、制限

したがって、ディスク13に付着した塵により、ディスク13の表面に接触する磁気ヘッドに悪影響を与えるような事態を大幅に防止することができる。

〔発明の効果〕

以上詳述したように本発明によれば、フロッピーディスク装置において、装置本体内にディスクが挿入されていない状態での外部からの塵の進入を大幅に低減することができる。さらに、ディスクの挿入時にディスクに付着した塵を除去し、塵により磁気ヘッドのリード／ライト動作に支障が来たような事態を大幅に防止することができる。

したがって、結果的にフロッピーディスク装置の防塵効果を高めることができ、高記録密度のディスクを使用した場合でも、塵により磁気ヘッドに障害が発生するような事態を未然に防止することが可能となり、ディスクに対する確実なリード／ライト動作を実現することが可能となるものである。

4. 図面の簡単な説明

第1図乃至第3図はそれぞれ本発明の実施例に

部材21dがディスク13の表面に接触することにより、フロントパネル20側への回転移動を制限されている。これにより、ディスク13がイジェクトされる際に、第1の防塵機構21の機構本体21aに遮断されてイジェクト不可になるような事態を防止することができる。ここで、制限部材21d及び防塵部材22bは回転状態のディスク13に接触することになるが、スプリング21c, 22cの調整によりディスク13の回転駆動に支障が発生することはない。

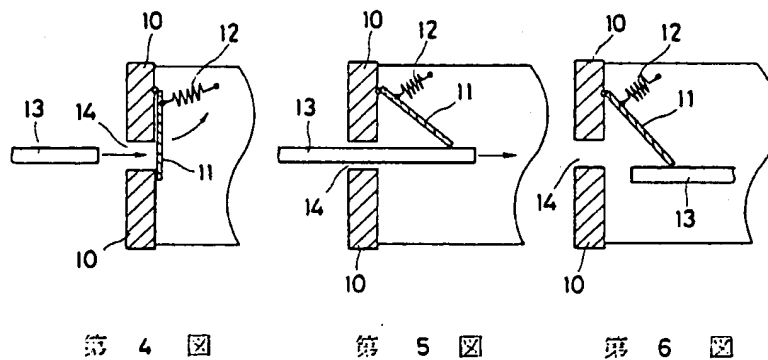
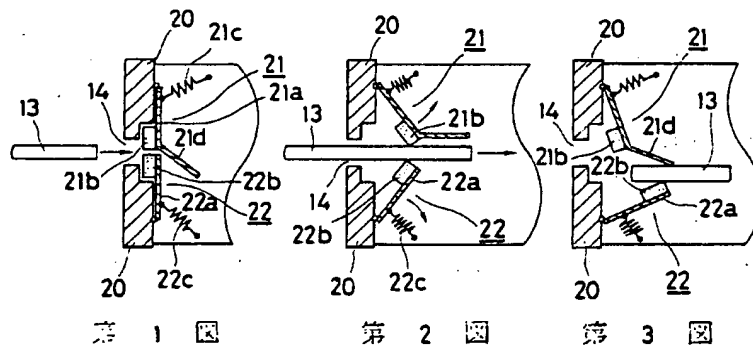
ディスク13がイジェクトされる際には、第1の防塵機構21及び第2の防塵機構22の各機構本体21a, 22aは、フロントパネル20側へ回転し、第1図に示すような状態に復帰することになる。

このようにして、ディスク13の非挿入状態では防塵部材21b, 22bがドアのような動きをし、外部から出入れ用スリット14を通じて進入する塵を大幅に低減することができる。また、ディスク13の挿入時には、防塵部材21b, 22bによりディスク13の両面に付着した塵が除去されることになる。

係わるディスク出入機構の構成を示す側面断面図、第4図乃至第6図はそれぞれ従来のディスク出入機構の構成を示す側面断面図である。

10、20…フロントパネル、13…ディスク、
14…出入れ用スリット、21…第1の防塵機構、
22…第2の防塵機構、21a、22a…機構本体、
21b、22b…防塵部材、21c、22c…スプリング、
21d…制限部材。

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] About the disk storage which was made to perform record (writing) and/or playback (read-out) of an information signal using disk-like storages, such as an optical disk and a magneto-optic disk, in case this invention inserts a disk-like storage into the body of equipment especially, it relates to the disk storage it was made not to damage an information storage side.

[0002]

[Description of the Prior Art] Conventionally, generally as this kind of disk storage, the thing as shown in drawing 17 and drawing 18 is known, for example. This disk storage 1 is a CD (compact disk) player for mount carried in an automobile etc., and the condition of having moved the front panel 2 to drawing 17 and drawing 18, and having opened the disk insertion opening 3 is expressed.

[0003] This CD player 1 is equipped with the front panel 2 grade currently supported possible [tilting in the front face of the body 4 of equipment with which the disk insertion opening 3 was formed in the abbreviation center section of the front upper part, and this body 4 of equipment]. The disk insertion opening 3 prepared in the body 4 of equipment consists of a slot of the shape of a slit formed in the longitudinal direction long and slender. And it has prevented that the flat surface of CD5 is damaged by sticking the friction reduction material 6 which consists of population suede on the periphery section of the disk insertion opening 3, and preventing grinding the flat surface of CD5 against this friction reduction material 6 strongly.

[0004] The drop which displays play conditions chosen by these actuation dial 7 grade, such as control information and music playback, as much actuation switches for operating this CD player 1 and the actuation dial 7 is attached in the front panel 2 arranged in the front face of this body 4 of equipment. This front panel 2 has the role of the lid for opening and closing the disk insertion opening 3, and is supported possible [tilting] by the tilting device 8 prepared in the body 4 side of equipment.

[0005] The front panel 2 can take selectively the condition shown in drawing of having inclined, and the condition which is not illustrated of having risen, by actuation of this tilting device 8. And after the front panel 2 has inclined, the disk insertion opening 3 is opened and the disk insertion opening 3 is thoroughly closed by starting the front panel 2.

[0006]

[Problem(s) to be Solved by the Invention] However, in such conventional disk storage, although the friction reduction material 6, such as population suede, is stuck on the periphery section of the disk insertion opening 3 which makes the shape of a slit and he was trying to aim at protection of CD5, since the disk insertion opening 3 consisted of slots with thin square, even if it was the friction reduction material 6 with a soft front face, there was instead of [no] in grinding with the front face of CD5. Therefore, the information storage side of CD5 was ground by the friction reduction material 6, and the technical problem that an information storage side was damaged by the conditions of the sliding surface of the way and dust which the frictional force requires having adhered occurred.

[0007] Moreover, when the projection used as the obstruction of actuation dial 7 grade is in the front panel 2, also as for the projection, the wrap need exists with population suede etc. Therefore, the projection itself became big by wrap population suede etc. about the projection, and the technical problem that the miniaturization of the whole equipment could not be attained also occurred.

[0008] In case this invention is made in view of such a conventional technical problem and inserts a disk-like storage in disk insertion opening, when contacting only the periphery edge and making it the information storage side of the inside not contact the periphery section of disk insertion opening etc., it aims at solving the above-mentioned technical problem.

[0009]

[Means for Solving the Problem] In order to solve a technical problem which was mentioned above and to attain the above-mentioned object, the disk storage concerning claim 1 of this invention In disk storage equipped with the body of equipment which has slit-like disk insertion opening with which a disk-like storage is inserted In order to prepare in the body of equipment in support of the guide member made movable [the front of disk insertion opening] rotatable and to guide the periphery edge of a disk-like storage to this guide member, it is characterized by the thing which made the central site concave and which was established for the disk guide of the shape of circular or V character.

[0010] A guide member is the guide bracket attached in the body of equipment rotatable, and the disk storage concerning claim 2 of this invention is characterized by making it make a disk guide counter disk insertion opening at one migration edge of this guide bracket.

[0011] The disk storage concerning claim 3 of this invention prepares a disk guide in the top face of a guide bracket, and is characterized by making it make a disk guide counter disk insertion opening by toppling this guide bracket to the front.

[0012] Furthermore, the disk storage concerning claim 4 of this invention is characterized by setting the disk guide of a guide bracket as the depth which can avoid the projection which protruded on the lid attached in the body of equipment rotatable.

[0013] Moreover, the disk storage concerning claim 5 of this invention is the lid attached in the body of equipment rotatable, in order that a guide member may open and close disk insertion opening, and it is characterized by making it make a disk guide counter disk insertion opening at one migration edge of this lid.

[0014] And the disk storage concerning claim 6 of this invention prepares a disk guide in the front face or rear face when closing disk insertion opening of a lid, and is characterized by making it make a disk guide counter disk insertion opening by rotating this lid.

[0015] In the disk storage applied to claim 1 of this invention by having constituted as mentioned above, since only the periphery edge of a disk-like storage ****s to a disk guide and the inside does not contact a disk guide by inserting a disk-like storage along with the disk guide prepared in the guide member, it can prevent that the information storage side of a disk-like storage is damaged.

[0016] In the disk storage concerning claim 2 of this invention, since only the periphery edge of a disk-like storage ****s to a disk guide and the inside does not contact the parts of a disk guide or others by inserting a disk-like storage along with the disk guide prepared in the guide bracket, it can prevent that the information storage side of a disk-like storage is damaged.

[0017] A disk guide can be made to counter disk insertion opening only by toppling a guide bracket to the front with the disk storage concerning claim 3 of this invention.

[0018] Furthermore, in the disk storage concerning claim 4 of this invention, since the depth of a disk guide is deep enough, the projection which protruded on the lid can be avoided and a disk-like storage can be inserted in disk insertion opening.

[0019] Moreover, in the disk storage concerning claim 5 of this invention, since only the periphery edge of a disk-like storage ****s to a disk guide and the inside does not contact the parts of a disk guide or others by inserting a disk-like storage along with the disk guide prepared in the lid, it can prevent that the information storage side of a disk-like storage is damaged.

[0020] And a disk guide can be made to counter disk insertion opening with the disk storage concerning claim 6 of this invention only by rotating a lid and turning a front face or a rear face upwards.

[0021]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing. Drawing 1 - drawing 16 are applied to the CD player for mount only for playbacks in which the example of operation of this invention is shown and one example of the disk storage which was made to reproduce the information signal as a disk-like storage using CD (compact disk) (read) is shown.

[0022] That is, the front view in the condition that drawing 1 - drawing 7 show the 1st example of the CD player for mount concerning this invention, and drawing 1 opened the front panel, and drawing 2 are the same, a top view and drawing 3 are the same, a side elevation, the explanatory view in which drawing 4 shows the guide opening close device of a guide member, the explanatory view in which drawing 5 shows the panel closing motion device of the front panel, the side elevation in the condition that drawing 6 closed the front panel, and drawing 7 are the same, and it is a front view.

[0023] Moreover, the front view in the condition that drawing 8 - drawing 11 show the 2nd example of the CD player for mount concerning this invention, and drawing 8 opened the front panel, and drawing 9 are the same, a side

elevation, the side elevation in the condition that drawing 10 closed the front panel, and drawing 11 are the same, and it is a front view.

[0024] Furthermore, the front view in the condition that drawing 12 - drawing 16 show the 3rd example of the CD player for mount concerning this invention, and drawing 12 opened the front panel, and drawing 13 are the same, a side elevation, the explanatory view in which drawing 14 shows the panel closing motion device of the front panel, the side elevation in the condition that drawing 15 closed the front panel, and drawing 16 are the same, and it is a front view.

[0025] As shown in drawing 1 - drawing 7, CD player 10 for mount concerning this 1st example is equipped with the front panel 12 grade which shows one example of the body 11 of equipment with which the disk loading device, and the equipment and the device of an optical pickup and others were built in, and the lid supported possible [tilting in the front face of this body 11 of equipment].

[0026] The body 11 of equipment is equipped with the sheathing member 13 which consists of a box object formed with the sheet metal etc., and the front member 14 with which it is equipped so that opening by which opening was carried out to the transverse plane of this sheathing member 13 may be closed. Joint piece 14a which enters in opening of the sheathing member 13 is prepared in the longitudinal direction both-sides section of the front member 14, respectively, the front member 14 is combined with the sheathing member 13 by fasten lump of the lock screw which penetrates the side-face plate of the sheathing member 13, and is screwed in the screw hole of joint piece 14a in one, and the body 11 of equipment is constituted.

[0027] As shown in drawing 1, in the abbreviation center section of the front upper part of the front member 14, the disk insertion opening 15 which consists of a slot of the shape of a slit made into ** length is formed in the longitudinal direction. Although this disk insertion opening 15 has penetrated front flesh-side both sides of the front member 14 forward and backward and not being illustrated inside this disk insertion opening 15, the disk loading device which holds CD16 in which one example of the inserted disk-like storage is shown, and carries out chucking to a spindle motor is arranged.

[0028] While the long side which counters the flat surface of CD16 inserted of this disk insertion opening 15 is greatly set up a little rather than the overall diameter of CD16, the shorter side which counters in those longitudinal direction both ends is set as about 2 to 3 times [of the thickness of CD16] magnitude. Furthermore, the radii-like radii guides 17a and 17b are formed in the vertical both sides by the side of the long side of the disk insertion opening 15, respectively. let these radii guides 17a and 17b be the circular faces which made the central site of a longitudinal direction concave -- having -- **** -- the up-and-down radii guides 17a and 17b -- abbreviation -- the radius of curvature of the same magnitude -- having -- between the longitudinal direction both ends and longitudinal direction center section -- a variation rate -- the amount E1 is set up.

[0029] As shown in drawing 1 - drawing 4, the guide bracket 18 in which the 1st example of the guide member whose tilting was enabled so that the disk insertion opening 15 might be opened and closed in the inside of the front panel 12 is shown is attached in the front face of this front member 14. This guide bracket 18 has body of guide 18a by which the radii guide 19 in which the 1st example of a disk guide is shown was formed in the top face, and rotation shank 18b prepared so that it might project to longitudinal direction both outsides in the soffit section of this body of guide 18a. Rotation shank 18b on either side is supported respectively free [rotation] by bearing 14b prepared in the front member 14.

[0030] As shown in drawing 4, fitting of the coil section 20a of a torsion coil spring 20 is loosely carried out to rotation shank 18b, it is stopped by spring bearing hole 14c which spring piece 20b which follows the end of this coil section 20a prepared in the front member 14, and spring piece 20c which follows the other end is stopped by body of guide 18a. The guide bracket 18 is always energized in the outside, i.e., the direction which opens the disk insertion opening 15, by the spring force of this torsion coil spring 20. And it constitutes so that the radii guide 19 prepared in the upper bed side of body of guide 18a in this state of restriction by stopper 14d prepared in bearing 14b while restricting migration to the front of the guide bracket 18 may counter the disk insertion opening 15 and it may become : predetermined height location.

[0031] The upper bed section of body of guide 18a of this guide bracket 18 is formed in the outside high so that the center section of the longitudinal direction may serve as concave, also when it sees from any of a transverse plane and : flat surface, as shown in drawing 1 and drawing 2, and overhang section 18c which projects ahead is prepared in both ends. The radii guide 19 prepared in the upper bed section of this body of guide 18a is formed with radius of curvature smaller than the radius of curvature of the vertical radii guides 17a and 17b of the disk insertion opening 15, and, thereby, has set up more greatly than the amount E1 of displacement of the vertical radii guides 17a and 17b the amount E2 of displacement between longitudinal direction both ends and a longitudinal direction center section.

[0032] thus, the center of the radii guide 19 -- a variation rate -- an amount E2 -- the center of the vertical radii guides

17a and 17b -- a variation rate -- the reason made larger than an amount E1 is for preventing more certainly that enlarge height change with radii and the information storage side of CD16 contacts the radii guide 19. He is trying for this to take large height H to the disk location of CD16b in case an overall diameter passes the disk insertion opening 15 from the disk location of CD16a at the time of insertion initiation, as shown in drawing 4 .

[0033] Consequently, at the time of insertion initiation, the location of CD16 can move to a predetermined height location at an early stage by advancing insertion to the projection in the height in which it interferes, and interference with obstructions, such as a projection, can be avoided so that it may mention later. Tilting actuation of this guide bracket 18 is performed so that the switching action of the front panel 12 may be interlocked with.

[0034] The front panel 12 consists of an oblong hollow plate, and the printed-circuit board with which required electronic parts were carried in the interior is contained. As shown in drawing 7 , the actuation dial 24 grade which shows one example of the display 22 of the oblong square arranged in the abbreviation center section, the control unit 23 which has the manual operation button of a large number arranged so that the perimeter of this display 22 may be surrounded, and the projection arranged on the left of a display 22 is arranged in the front face of this front panel 12. And the closing motion carbon button 25 of the panel closing motion device 30 to which the switching action of this front panel 12 is carried out is attached in the front upper right portion.

[0035] This panel closing motion device 30 has the configuration as shown in drawing 5 . Namely, the base panel 31 by which the panel closing motion device 30 is arranged in the transverse-plane abbreviation center section of the front member 14, and fixed support is carried out at the body 11 of equipment, The slide lever 32 supported movable by the body 11 of equipment to a cross direction, The rack 33 by which fixed support is carried out at this slide lever 32, and the drive motor 34 which generates driving force as a driving source, It has the panel holder 36 grade which carries out tilting actuation of the front panel 12 based on the power transfer gear train 35 which the power of this drive motor 34 is transmitted [train] to a rack 33, and carries out sliding actuation of the slide lever 32 to a cross direction, and actuation before and after the slide lever 32.

[0036] A flat-surface configuration consists of a panel member which makes the shape of a KO character, and the base panel 31 is attached in the body 11 of equipment by fixing fixed piece 31a prepared in the soffit section to the chassis which is not illustrated by means for detachable, such as a lock screw. Into the crevice of this base panel 31, the back of the front panel 12 in the condition of having started is inserted. The vertical guide hole 37 which made it incline a little back and made it extend in the vertical direction is established in side-face piece 31b prepared in the both-sides section of this base panel 31. This vertical guide hole 37 is formed so that opening may be carried out to the front in the upper bed section, from this opening, the guide pin 38 of the panel holder 36 is inserted, and engagement maintenance of the sliding of it is enabled in the vertical direction.

[0037] The panel holder 36 is considered as the configuration which can carry out fitting maintenance of the back of the front panel 12, is made to correspond to each side-face piece 31b, support piece when guide pin 38 is fixed 36a is prepared in the upper part of the longitudinal direction both-sides section, and bottom support piece 36b is prepared in the lower part. The connection pin 39 is being fixed to support-under this panel holder 36 piece 36b, and fitting of the rotation of this connection pin 39 is made free to the pin hole prepared in the point of the slide lever 32.

[0038] This slide lever 32 consists of long and slender plate-like part material prolonged in the cross direction, and two horizontal guide holes 40a and 40b which extend in a cross direction and which were considered as parallel are established in the section that first portion and the second half. The guide pins 41a and 41b prepared in the body 11 of equipment are engaged respectively possible [sliding], it is guided to these guide pins 41a and 41b, and the slide lever 32 can move to these horizontal guide holes 40a and 40b linearly to a cross direction. Furthermore, near the anterior part horizontal guide hole 40a of the slide lever 32, where many gear teeth are turned upwards, the rack 33 is attached in one.

[0039] On this rack 33, the actuation gear 42 supported by the base panel 31 free [a revolution] through support shaft 31c meshes. On this actuation gear 42, 5th medium gear 35e of the power transfer gear train 35 is prepared in one, and 4th medium gear 35d has geared at this 5th medium gear 35e. Furthermore, 3rd medium gear 35c geared to 4th medium gear 35d, and 1st medium gear 35a has geared to 2nd medium gear 35b prepared in this and one. And the worm gear 43 is formed in 1st medium gear 35a at one, and the worm 44 which geared to this worm gear 43 is being fixed to revolving-shaft 34a of a drive motor 34.

[0040] This drive motor 34 is being fixed to the chassis (not shown) of the body 11 of equipment. Furthermore, a worm gear 43 and 1st medium gear 35a are supported by 1st support shaft 45a, and 2nd medium gear 35b and 3rd medium gear 35c are supported by 3rd support shaft 45c respectively free [rotation] 4th medium gear 35d at 2nd support shaft 45b. and these the 1- the 3rd support shaft 45a-45c is set up by the chassis, respectively.

[0041] Revolution actuation of the drive motor 34 is selectively carried out to a clockwise rotation R and a

counterclockwise rotation L by operating the closing motion carbon button 25 and switching the switch for motors in this way. This drive motor 34 is driven and the slide lever 32 carries out slide actuation according to the hand of cut of the actuation gear 42 by transmitting turning effort to a rack 33 from the actuation gear 42 through a worm gear (44 and 43) and the power transfer gear train 35.

[0042] That is, if the actuation gear 42 rotates to a clockwise rotation R, through a rack 33, the slide lever 32 will move back and will draw near the soffit section of the front panel 12 back through the connection pin 39. Thereby, the guide pin 38 set as the upper bed section of the front panel 12 is guided to the vertical guide hole 37, and moves upwards. And while the slide lever 32 moves to the back end, when a guide pin 38 moves to an upper bed in the vertical guide hole 37, the front panel 12 changes to the condition that the abbreviation perpendicular rose, as shown in drawing 6 and drawing 7. Consequently, in the front panel 12, it will be thoroughly closed by the disk insertion opening 15.

[0043] On the other hand, if the actuation gear 42 rotates to a counterclockwise rotation L, through a rack 33, the slide lever 32 will move to the front and will extrude the soffit section of the front panel 12 ahead through the connection pin 39. When it can come, simultaneously a guide pin 38 is guided to the vertical guide hole 37, moves below and arrives at a soffit, as shown in drawing 1 - drawing 3, the front panel 12 changes to the condition of slanting facing up. Consequently, it will be thoroughly opened by the disk insertion opening 15, and the insertion actuation of CD16 of it will be attained after that.

[0044] In CD player 10 for mount which has such a configuration, by pressing the closing motion carbon button 25, the drive motor 34 of the panel closing motion device 30 drives, and it falls back, the lower part pushing out ahead, as mentioned above, and the front panel 12 is opened from the condition which the front panel 12 shown in drawing 6 and drawing 7 closed. This changes to the condition that the front section of CD player 10 for mount shows drawing 1 - drawing 3, and the disk insertion opening 15 is opened.

[0045] Under the present circumstances, since the force which regulates the rotation to the front of the guide bracket 18 arranged by opening the front panel 12 at that inside is removed, after that, it rotates to the front according to the spring force of a torsion coil spring 20, and changes to the condition that it is shown in drawing 4. Thereby, as shown in drawing 1, the guide bracket 18 is toppled ahead the degree of predetermined angle, and the disk insertion opening 15 will be opened thoroughly.

[0046] Then, CD16 is changed into a level condition and inserted in the disk insertion opening 15. In this case, if CD16 is inserted in the disk insertion opening 15 and it goes as shown in drawing 1 - drawing 4, first, the insertion side point of CD16 will reach the radii guide 19 of the guide bracket 18, and that insertion side point will reach the disk insertion opening 15 by advancing insertion further.

[0047] Under the present circumstances, the location of CD16a at the time of insertion initiation is in the actuation dial 24 and the height in which it interferes, as Sign-T-shows drawing 1 and drawing 2, but the disk width of face located in this actuation dial 24 part is small, and since the part which is that overall diameter is still located behind the actuation dial 24, this CD16 does not cause the actuation dial 24 and interference. Furthermore, if insertion of CD16 is continued insertion actuation will be continued, while the periphery edge of CD16 is guided to the radii guide 19 of the guide bracket 18, is drawn up and makes the location high.

[0048] And when the overall diameter part of CD16 arrives at the location of the actuation dial 24, the location of CD16 was moved to the location high enough by the radii guide 19, and it has come to overcome the actuation dial 24. Consequently, the actuation dial 24 does not contact the information storage side of CD16, and the information storage side where the part in contact with the radii guide 19 is only the periphery edge, and CD16 is set to the inside does not contact the radii guide 19. Therefore, it faces inserting CD16 in the disk insertion opening 15, and clear information playback which does not grind and damage the information storage side and does not have a blemish can be performed.

[0049] Then, also when CD16 passes the disk insertion opening 15, though the information storage side of CD16 does not contact the periphery section of the disk insertion opening 15 and being contacted, it is only a periphery edge where record of an information signal is not made. Therefore, CD16 can be certainly inserted into CD player 10 from the disk insertion opening 15, without damaging the information storage side. This is the same also in fetch actuation of CD16, and it can be taken out from the disk insertion opening 15, without similarly damaging the information storage side of CD16.

[0050] CD player 50 for mount concerning the 2nd example of this invention shown in drawing 8 - drawing 11 stops the activity of the guide bracket 18 in the above-mentioned example, forms the radii guide 53 in which the 2nd example of a disk guide is shown in the front face of the front panel 52 which shows the 2nd example of a guide member, and receives CD16 soon in this radii guide 53.

[0051] As shown in drawing 8, the radii guide 53 of the shape of radii as a disk guide which made concave the central

site of the longitudinal direction which is a longitudinal direction is formed in the front face of the front panel 52. In order to satisfy the function of this radii guide 53, the projection of actuation dial 24 grade mentioned above is not prepared, but the whole is superficially constituted by the front face of this front panel 52. Other configurations are the same as that of the 1st example mentioned above, and the same effectiveness as the 1st example of the above can be acquired also by considering as this configuration. Furthermore, the configuration of the whole part equipment without the front member 14 can be made to simplify in this 2nd example.

[0052] CD player 60 for mount concerning the 3rd example of this invention shown in drawing 12 - drawing 16 is considered as the configuration which rotates the front panel 62 ahead in support of the lower part of the front panel 62 rotatable by the base panel 61, and makes the disk insertion opening 15 open. And the radii guide 63 in which the 3rd example of a disk guide is shown is formed in the tooth back of the front panel 62 which shows the 3rd example of a guide member, and it constitutes so that this radii guide 63 may receive CD16.

[0053] the base panel 61 avoids the disk insertion opening 15, as shown in drawing 12 -- it is attached in front 1 flank of the front member 64 such. This base panel 61 consists of a panel member to which a flat-surface configuration makes the shape of a KO character as shown in drawing 14, and the locking lever 65 and the opening lever 66 of the panel closing motion device 70 are contained rotatable in the crevice of this base panel 61 up down one, respectively. By starting the part, the up-and-down support pieces 67a and 67b are formed in side-face piece 61a prepared in the both-sides section of the base panel 61 so that a longitudinal direction may be countered, respectively. And among support-on base panel 61 piece 67a, through support shaft 68a, a locking lever 65 is supported free [rotation] and the opening lever 66 is supported free [rotation] through support shaft 68b among bottom support piece 67b.

[0054] A locking lever 65 consists of a lever member formed in inverse L-shaped, and support shaft 68a is inserted in the bearing hole established in the base free [rotation]. Fitting of the coil section of torsion coil spring 69a is loosely carried out to the base of this locking lever 65, the spring piece which follows the end of this coil section is stopped by top support piece 67a, and the spring piece which follows the other end of the coil section is stopped by the locking lever 65. The locking lever 65 is always energized by the spring force of this torsion coil spring 69a at the front panel 62 side. Stop pawl 65a for stopping the base panel 61 is prepared at the head of this locking lever 65 at the inner sense. And inside stop pawl 65a, stop section 65b for being engaged and locking the opening lever 66 is prepared.

[0055] Moreover, the opening lever 66 consists of a lever member by which radii-like evasion section 66a was formed in the center section, and **-like lock section 66b was formed in the point, and support shaft 68b is inserted in the bearing hole established in the base free [rotation]. Fitting of the coil section of torsion coil spring 69b is loosely carried out to the base of this opening lever 66, the spring piece which follows the end of this coil section is stopped by bottom support piece 67b, and the spring piece which follows the other end of the coil section is stopped by the opening lever 66. The opening lever 66 is always energized by the spring force of this torsion coil spring 69b at the front panel 62 side.

[0056] Evasion section 66a of this opening lever 66 is prepared in order to avoid interference with the base of a locking lever 65. By raising this opening lever 66 and piling up lock section 66b beside a locking lever 65, the base of a locking lever 65 enters in the crevice of evasion section 66a, and interference of both the levers 65 and 66 can be avoided now. Lock pin 66c which projects in a locking lever 65 side is prepared in lock section 66b of this opening lever 66. The opening lever 66 is stopped and locked by the locking lever 65 by stopping this lock pin 66c in stop section 65b of a locking lever 65.

[0057] Moreover, panel support piece 61b which projects ahead is prepared in the lower part of piece of both-sides side 61a of the base panel 61, respectively. Support shaft 61c penetrates among these panel support piece 61b, and the front panel 62 is supported by this support shaft 61c free [rotation]. Furthermore, the actuation gear 71 is being fixed to support shaft 61c, and the standing-up [which rotated to 90 degree front as the front panel 62 showed this actuation gear 71 to drawing 12 - drawing 14 by carrying out revolution actuation] condition which closed disk insertion opening thoroughly as it was indicated in drawing 15 and drawing 16 as a condition can be selectively taken now by bending forward.

[0058] As shown in drawing 12, the radii guide 63 of the shape of radii as a disk guide which made concave the central site of the longitudinal direction which is a longitudinal direction is formed in the tooth back of the front panel 62. Although there is no projection in the tooth-back center section of the front panel 62 in order to satisfy the function of this radii guide 63, the lock receiving part 72 which is stopped by the locking lever 65 and locked is formed in one flank which avoided the field through which CD16 passes.

[0059] The actuation dial 75 grade arranged on the left of the display 73 of the oblong square arranged in the abbreviation center section, the control unit 74 which has the manual operation button of a large number arranged so that the perimeter of this display 73 may be surrounded, and a display 73 is similarly arranged with on the other hand,

the 1st example having described to the front face of the front panel 62, as shown in drawing 16 . And the closing motion carbon button 76 of the panel closing motion device 70 to which the switching action of this front panel 62 is carried out is attached in the front upper right portion.

[0060] In CD player 60 for mount which has such a configuration, if the closing motion carbon button 76 is pressed, a locking lever 65 will rotate back focusing on support shaft 68a, stop section 65b will retreat, and engagement of lock pin 66c will be canceled of the condition which the front panel 62 shown in drawing 15 and drawing 16 closed. Thereby, the opening lever 66 rotates ahead by the spring force of torsion coil spring 69b, and the upper part of the front panel 62 is extruded by the rotation force to the front. Consequently, the front panel 62 rotates clockwise in drawing 14 focusing on support shaft 61c, and the disk insertion opening 15 is opened.

[0061] Then, by changing CD16 into a level condition and inserting it in the disk insertion opening 15, like the 2nd example mentioned above, the insertion side point of CD16 is guided to the radii guide 63, and is inserted into CD player 60 from the disk insertion opening 15. In case this CD16 passes the disk insertion opening 15, though the information storage side of CD16 does not contact the periphery section of the disk insertion opening 15 and being contacted, it is only a periphery edge where record of an information signal is not made. Therefore, CD16 can be certainly inserted into CD player 60 from the disk insertion opening 15, without damaging the information storage side

[0062] In shutting the front panel 62, it causes the upper part of the front panel 62 by hand from the condition shown in drawing 14 . And lock pin 66c of the opening lever 66 enters in stop section 65b of a locking lever 65 by starting the front panel 62 until it causes the opening lever 66 by the rotation force of the front panel 62 and the disk insertion opening 15 closes thoroughly. Thereby, the opening lever 66 is locked by the locking lever 65. The lock receiving part 72 enters in stop pawl 65a of a locking lever 65, and, similarly the front panel 62 is locked by the locking lever 65 so that this may be interlocked with. Consequently, the front face of the front member 64 is equipped with the front panel 62, and lock out of the disk insertion opening 15 by the front panel 62 is completed.

[0063] Although this invention is not limited to the example of the above-mentioned implementation although it explains above, and the example applied to the CD player for mount reproduced to dedication as an information storage in the example of the above-mentioned implementation using an optical disk was explained, it is applicable not only to the object for mount but the usual CD player. Furthermore, it is applicable to the disk record regenerative apparatus both for [which enabled not only playback but record] record playback, and various kinds of other disk storage using the disk-like storage of not only CD but a magneto-optic disk and others.

[0064] Moreover, although the example of the above-mentioned implementation explained the example applied to the radii guides 17a, 17b, 19, 53, and 63 which have a radii-like curved surface as a disk guide, it can replace with radii, and can consider as a V character-like flat surface, and the same effectiveness as the above-mentioned example can be acquired also by this. Thus, this invention can be variously changed in the range which does not deviate from the meaning.

[0065]

[Effect of the Invention] As explained above, in order that according to the disk storage concerning claim 1 of this invention only the periphery edge of a disk-like storage may **** to a disk guide and the inside may not contact a disk guide by inserting a disk-like storage along with the disk guide prepared in the guide member, the effectiveness that the disk storage which can prevent that the information storage side of a disk-like storage is damaged can be offered is acquired. And since the activity of protection members, such as artificial suede for protecting a disk-like storage, can be abolished, it can contribute also to the cutback of components mark.

[0066] In order that according to the disk storage concerning claim 2 of this invention only the periphery edge of a disk-like storage may **** to a disk guide and the inside may not contact the parts of a disk guide or others by inserting a disk-like storage along with the disk guide prepared in the guide bracket, the effectiveness that the disk storage which can prevent that the information storage side of a disk-like storage is damaged can be offered is acquired

[0067] According to the disk storage concerning claim 3 of this invention, the effectiveness that the disk storage which can make a disk guide counter disk insertion opening can be offered only by toppling a guide bracket to the front is acquired.

[0068] Furthermore, according to the disk storage concerning claim 4 of this invention, since the depth of a disk guide is deep enough, the effectiveness that the disk storage which avoids the projection which protruded on the lid and can insert a disk-like storage in disk insertion opening can be offered is acquired.

[0069] Moreover, in order that according to the disk storage concerning claim 5 of this invention only the periphery edge of a disk-like storage may **** to a disk guide and the inside may not contact the parts of a disk guide or others

by inserting a disk-like storage along with the disk guide prepared in the lid, the effectiveness that the disk storage which can prevent that the information storage side of a disk-like storage is damaged can be offered is acquired.
[0070] And according to the disk storage concerning claim 6 of this invention, the effectiveness that the disk storage which can make a disk guide counter disk insertion opening can be offered only by rotating a lid and turning a front face or a rear face upwards is acquired.

[Translation done.]

* NOTICES *

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a front view in the condition of the CD player for mount concerning the 1st example of the disk storage of this invention being shown, and having opened the front panel.

[Drawing 2] It is a top view in the condition of having opened the front panel of the CD player for mount shown in drawing 1.

[Drawing 3] It is a side elevation in the condition of having opened the front panel of the CD player for mount shown in drawing 1.

[Drawing 4] It is the explanatory view showing the guide opening close device of the guide member of the CD player for mount shown in drawing 1.

[Drawing 5] It is the explanatory view showing the panel closing motion device of the front panel of the CD player for mount shown in drawing 1.

[Drawing 6] It is a side elevation in the condition of having closed the front panel of the CD player for mount shown in drawing 1.

[Drawing 7] It is a front view in the condition of having closed the front panel of the CD player for mount shown in drawing 1.

[Drawing 8] It is a front view in the condition of the CD player for mount concerning the 2nd example of the disk storage of this invention being shown, and having opened the front panel.

[Drawing 9] It is a side elevation in the condition of having opened the front panel of the CD player for mount shown in drawing 6.

[Drawing 10] It is a side elevation in the condition of having closed the front panel of the CD player for mount shown in drawing 1.

[Drawing 11] It is a front view in the condition of having closed the front panel of the CD player for mount shown in drawing 1.

[Drawing 12] It is a front view in the condition of the CD player for mount concerning the 3rd example of the disk storage of this invention being shown, and having opened the front panel.

[Drawing 13] It is a side elevation in the condition of having opened the front panel of the CD player for mount shown in drawing 10.

[Drawing 14] It is the explanatory view showing the panel closing motion device of the front panel of the CD player for mount shown in drawing 10.

[Drawing 15] It is a side elevation in the condition of having closed the front panel of the CD player for mount shown in drawing 10.

[Drawing 16] It is a front view in the condition of having closed the front panel of the CD player for mount shown in drawing 10.

[Drawing 17] It is a front view in the condition of the conventional CD player for mount being shown and having opened the front panel.

[Drawing 18] It is a side elevation in the condition of having opened the front panel of the conventional CD player for mount.

[Description of Notations]

10, 50, 60 -- A CD player (disk storage), 11 -- The body of equipment, 12, 52, 62 -- The front panel (guide member)
 13 -- Sheathing member, 14 64 -- A front member, 15 -- Disk insertion opening, 16, 16a, 16b -- Compact disk CD
 (disk-like storage) 17a, 17b, 19, 53, 63 -- Radii guide (disk guide), 18 -- A guide member, 20, 69a, 69b -- 24 Torsion
 coiled spring, 75 -- Actuation dial (projection), 25 76 [-- A slide lever, 65 / -- A locking lever, 65a / -- A stop pawl,

65b / -- The stop section, 66 / -- An opening lever, 66b / -- The lock section, 66c / -- A lock pin, 72 / -- Lock receiving part] -- 30 A closing motion carbon button, 70 -- 31 A panel closing motion device, 61 -- A base panel, 32

[Translation done.]